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Zhodnocení likvidity společnosti ve strojním průmyslu

Assessment of the Liquidity of a Company in the Machinery Industry

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1. Introduction
2. Description of the Liquidity Assessment Methodology
3. Basic Financial Characteristic of the Selected Company
4. Analysis of the Liquidity of the Selected Company
5. Conclusion

Bibliography
List of Abbreviations
Declaration of Utilisation of Results from the Bachelor Thesis
List of Annexes
Annexes

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The declaration

"Herewith I declare that I elaborated the entire thesis, including all annexes independently."

Ostrava dated 06.06.2016

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Contents:

1.Introduction

This thesis is aimed to the assessment of liquidity of a company in machinery industry.Liquidity means the ability to pay off the short-term debt.Company with a good liquidity will be harder to meet the problems on paying off the obligation. We will use the liquidity ratios to judge the company's liquidity.The liquidity ratio are current ratio,quick ratio and cash flow ratio and each of these ratio all has its emphases on the liquidity in different way.By use these ratios to analysis the company's liquidity,we can know its liquidity level and we will compare with the other companies in the same industry.We also will analysis what can influence company's liquidity and how to increase or decrease the liquidity. Our company can use this analysis to make decisions for the company to have a health liquidity.

There are five chapters in our thesis: The first chapter is introduction.We will introduce the aim why we do this thesis and basic information of how we analysis the liquidity of the company.

The second chapter is the description of the liquidity methodology.In this chapter,we will show you all the method we use in whole thesis.We will give the usages of the method we choose and what functions they have.We first introduce the function of financial statement.For analysis it, we will use the common-size analysis.From these we can get enough information to judge the company's financial situation and useful data to calculate the liquidity ratio.After that,we will choose one liquidity ratio to do the pyramidal decomposition.At last ,we will do the sensitive analysis.

The third chapter is about basic financial characteristic of the our company.we will first introduce the company's history and how it is developed.We also will introduce the brand of our company. Then will give it's financial statement and do common-size analysis which we informed in chapter 2 to know company's financial situation.We will have a basic acquaint of our company in this chapter.

The forth chapter is about analysis of the liquidity of the our company.In chapter 3, we get enough data and We will use this data to calculate the indicators liquidity

ratio.In this chapter,we will calculate 2 other companies' liquidity ratio in order to compare with our company.For clearly to compare the result,we firstly put the result into the table and then make it to the chart.We will get some conclusion from these and we want to know what cause the differences.So we choose the most typical liquidity ratio which is current ratio and decompose it to do pyramidal decomposition analysis.From theses,we can know the influence caused by different indicators.In the end, we will do sensitive analysis to help the company do the decision in next year.

The last chapter is conclusion.In this chapter, we will do summary for whole thesis.By using all the information and result we get from the analysis,we will give the final conclusion and our suggestions.

2.Description of Liquidity Assessment Methodology

In this chapter, we will describe liquidity assessment methodology which will be used in following chapters.There are five part in this chapter.They are financial statement,common-size analysis,liquidity ratio analysis,pyramidal decomposition analysis and sensitive analysis.

2.1 Financial Statement

The financial statement provides information about the company's financial situation,changes of the financial situation and performance.The information is useful for the people who want to do some investments and people who want to do analysis.Financial statement has the features of understandable,reliable,relevant and comparable.The assets, liabilities, equity, revenues and expenses are directly related to the company's financial situation.

For the managers of the company,they can use the detail from the financial statement to make decisions which will affect the continued operation.

For us, we can use the information to analysis the company's financial position and know it's advantages and disadvantages.

Financial statement reflect the financial activities of a company and it involves 3 parts. They are balance sheet, income statement and cash flow statement.

If we want to analysis the liquidity of a company,first we should get enough data and the data come from the financial statement.It is very important for our analysis.

2.1.1 Balance sheet

The balance sheet is the fundamental financial statement.The balance sheet provides a basic impression of a company's financial position to people.Always, a normal financial statement has 3 parts.They are assets,liabilities and equity. We give an example of balance sheet like Table 2.1 showed.In the balance sheet, assets is list the first,then is equity and liabilities. In the part of assets,it mainly involves current assets and long-term assets.For the liabilities,it mainly involves the current liabilities and long-term liabilities.For the equity,it reflects company's shareholder's equity and profit.

There is a relationship between the 3 elements of balance sheet like the formula 2.1 show us.The total assets is equal to the total liabilities and equity.We can image that equity and liabilities are the resources of the capital and assets are the resources of using capital.

$$TA = TL + E \qquad (2.1)^{1}$$

Table 2.1 An example of balance sheet

TOTAL ASSETS	TOTAL EQUITY+LIABILITIES
Long-term assets	**Equity**
Tangible assets	Share capital(par value)
Intangible assets	Contributed capital(in excess of par value)
Financial investment	Retained earnings
Other long-term assets	
Current assets	**Liabilities**
Inventories	Short-term borrowings
Account receivable	Long term debt
Marketable securities	Accounts payable
Other short-term assets	Notes payable
Cash and cash equivalents	Accrued expenses
Other assets	**Other liabilities**

Source: :DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.49.

[1] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.49.

From table 2.1,we can see the basic elements of a company's balance sheet.From that we can judge whether a company is good or bad.We can clearly know how many assets,liabilities and equity the company has and from that we can judge whether a company is rich or poor,the size is big or small and the shareholder's benefit is good or bad.So Balance sheet is the most important statement in financial statements.For our thesis,it has all the data we need to calculate the liquidity ratio.

2.1.2 Income statement

The income statement is a statement reflects information on the financial results of companies' business activities over a period of time.It includes the amount of revenues that the company attained during a period and the cost is connected to revenues.We can divide it into 3 elements:Revenues,Expenses and Net income/Loss.

The relation ship is:

$$Revenue - Expenses = Net\ Income/loss \quad (2.11)^2$$

Table 2.11 An example of income statement

+ Net revenues - Cost of good sold - Other operating costs(sales,marketing,administrative,etc) = Operating income
+ Financial revenues - Financial costs = Pre-tax income
- Income tax
=Net income

Source:DLUHOŠOVÁ, Dana et al.(2014). Financial management and decision-making of a company. Ostrava

[2] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.53.

2.1.3 Cash flow statement

Cash flow statement, mainly to reflect the impact of the balance sheet of the various items on the cash flow, and based on its use is divided into three activities of classification:operating activities investing activities and financial activities .

The cash flow statement shows us about a company's cash receipts and cash payment.We can also say it reflects a company's cash inflows and cash outflows.

It can be used to judge whether a company has enough cash to expense in a period.

We need to know:

$$Net\ Cash\ flow = CF(operate) + CF(investment) + CF(financial) \quad (2.12)^3$$

Table 2.12 An example of cash flow statement

+ Net income + Depreciation - Net inventories - Net accounts + Net accounts receivable + Net account payable = Cash flow from operating activities
- Net investments = Cash flow from investments activities
+ Net borrowing + Net retained earnings - Dividends + Net sale of stock = Cash flow from financial activities
Net cash flow =CF(operate)+CF(investment)+CF(financial)

Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava.

2.2 Common-size analysis

The common-size analysis is a important analysis methodology for company to know whether it's structure of financial statement is suitable.By this method,We can

[3] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.57.

compare total assets and total liabilities in balance sheet and we can use it to determine the condition of the development trend of corporate profitability in income statement.In cash flow statement,people can clearly know the specific sources of cash inflows and the specific usages of cash outflows.

2.2.1 Vertical analysis

Vertical analysis calculates each items on a financial statement as a percentage of another items and it gives us a insight into a company's reality.We can also use the results to compare with it's competitors to know the advantages and disadvantages in financial statement and we will realize what changes we will do for the next time.

In balance sheet,vertical analysis use the information of total asset,total liabilities and equity and then divides thesis three big items into more small items.For example,current assets are shown as a percentage of total assets.The same,current liabilities are shown as a percentage of total liabilities.

So the formula of vertical analysis is:

$$E\% = \frac{Ui}{\sum Ui} \bullet 100 \qquad (2.13)^{4}$$

2.2.2 Horizontal Analysis

The horizontal analysis compares the financial situation in one period with the financial situation in early period.It focuses on the horizontal data in the financial statement and analysis how they are changed and find the trend of them.

The formula in horizontal analysis are:

$$Absolute\ Change = U_t - U_{t-1} \qquad (2.23)$$

$$Percentage\ change = \frac{Ut - U(t-1)}{U(t-1)} \qquad (2.24)^{5}$$

As the formulas show us,we will calculate the change items in different period with absolute change and percentage change.By comparing with the results in different period,we can know the development of the company.

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[4] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.73.

[5] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.73.

2.3 Liquidity ratio analysis

Liquidity ratio is one kind of ratio in financial ratio.Different from other financial ratios,liquidity ratio aims to the liquidity of the company. This chapter will introduce you all the liquidity ratio and how they work.

Liquidity means the speed to translate valuable things to cash.For example,we can sell short-term bond easily and get money.That means short-term bond has a high liquidity.Usually,the liquidity of company aim to it's ability to translate the current assets to cash.The company with high liquidity will be easy to translate their current asset to cash and pay out their current liabilities.

2.3.1 Current ratio

The first liquidity we want to introduce is current ratio.It is the most typical liquidity ratio to reflect the liquidity of company.

Current ratio has 2 important parts.One is current assets and the other is current liabilities.Current assets are mainly cash, inventories and receivables.Cash can be borrowed from banks or companies or shareholder,inventories can be retained by the selling and the receivables can be part of the revenues from the sale.These elements can be easy translated to the money so we say they are current.Current liability are mainly short-term debt and payable.There are so many kinds of short-term debt like if company borrows money from the bank,it will have the short-term debt.Short-term debt is the easiest way to get capital with low cost for company and for it's term is short,company should have enough current assets to pay for it.The ability to translate the current assets to pay off the current liability is what we say the level of liquidity.
Current ratio judges company's liquidity by calculating the ratio of current assets and current liabilities. The formula of current ratio is:

$$Current\ Ratio = Current\ Assets / Current\ Liabilities \quad (2.3)^{6}$$

The higher the current ratio, the more capable the company is to pay its obligations.The ratio must in a range,if the current ratio is so high,that means the

[6] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.81.

company is not use it's capital efficiently and it need to do some investment in this situation.If the current ratio is low,the company maybe meet the dangerous problems in financial situation.If the maturity is came and the company hasn't enough money to pay the debt.It will spend too much by deal with it.Company should pay penalty for it does not pay back its obligations and the company's credit level will be decreased.The worst situation is even bankrupt.So it is very important to maintain a good level of current ratio to have a health financial situation.

At the side of the bank or institution,they are more preferred to lend money to the company which has the high current ratio in short-term.Because the company can pay it's debt easily than the company has low current liabilities.

At the side of the companies,if they have high current ratio,they can borrow money from bank or institution easier and will have better credit level than the companies whose current ratio is low.

2.3.2 Quick ratio

In current assets,beside inventories,other parts all can be translate to cash quickly.Because inventories need to be sell and this make it slowly be translated to cash.We can use these current assets which can be faster translate to cash than inventories to calculate the quick ratio.

The quick ratio is an liquidity ratio which can reflect company's short-term liquidity. The quick ratio measures a company's ability to meet its short-term obligations with its most liquid assets. For this reason, the ratio excludes inventories from current assets, and is calculated as follows:

$$Quick\ ratio = (Current\ assets - Inventories) / Current\ liabilities \quad (2.31)^{7}$$

As the formula show us,we can clearly see the difference between current ratio and quick ratio.Current ratio focuses on the whole current assets but quick ratio focuses on the most liquid assets from current assets.Quick ratio can judge company's

[7] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.82.

liquidity in shortest-term.If company meet some emergency situations and need to use money,the company with high quick ratio will be easier to deal with them.

2.3.3 Cash ratio

The cash ratio is an ratio of a company's liquidity that different from both the current ratio and the quick ratio.In current assets, cash and cash equivalents has the highest liquidity.The cash ratio uses the part of current assets with highest liquidity,we can see it is the most conservative way to judge company's liquidity.

The formula is:

$$\text{Cash ratio}=(\text{Cash} + \text{Cash equivalents}) / \text{Current liabilities} \qquad (2.32)$$ [8]

From chapter 2.21 and 2.22,we can know current ratio is a proportion of current asset to current liabilities and the quick ratio is a proportion of current asset with out inventories to current liabilities.But cash ratio only calculate the proportion of total cash in the current assets to current liabilities. So cash ratio can clearly reflect the liquidity when company don't use inventories and receivable to pay out it's current liabilities.

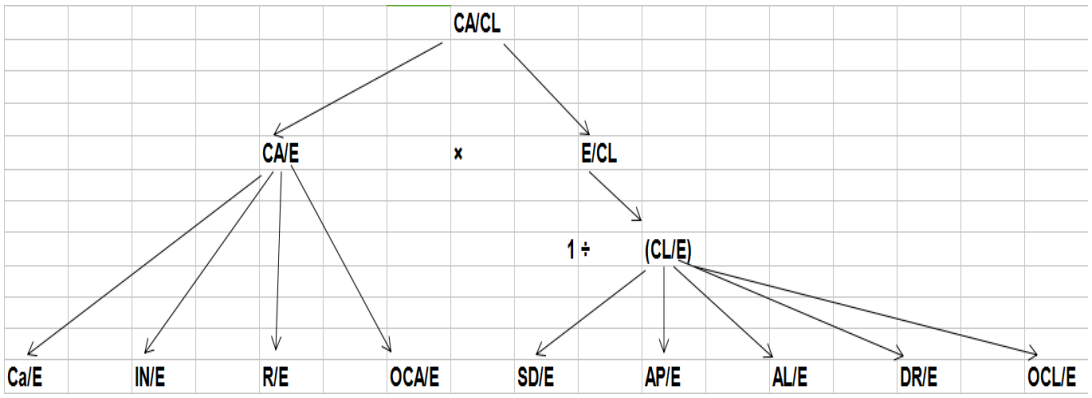
2.4 Pyramidal decomposition analysis

People use pyramidal decomposition analysis to decompose the financial ratio to several indicators relate to it.This analysis can make us clearly realize which indicator have a most important influence to the result.Through this analysis ,we can easy to know how to do in a specific way.

In our thesis ,we first find enough data from financial statement,then we calculate the liquidity ratio.When we calculate the same liquidity ratio for different companies in same industry,the result will be different and we want know what cause the different.So we decide to do pyramidal decomposition to the liquidity ratio we have calculated.We choose the current ratio and decompose it because we thick it is the typical liquidity ratio which can reflect the company's liquidity. we decompose the current ratio and as the chart show:

[8] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.82.

Chart 2.4 Pyramidal decomposition



From chart 2.4,we decompose the current ratio to 9 indicators,they are:Ca/E, IN/E, R/E, OCA/E, SD/E, AP/E, AL/E, DR/E, OCL/E.Where CA represent current assets and CL represent current liabilities and E represents equity.For the indicators,Ca represents total cash,IN represents inventories,R is revenues, OCA is other current assets,SD represents short-term debt,AP represents account payable,AL is accrued liabilities,DR is deferred revenues and OCL represents other current liabilities.We will calculate the influence of each indicators cause to the current ratio between 2 companies from 2011 to 2015.By this way we can know the reason why the current ratio has different and can give suggestion to our company.

2.4.1 Method of gradual change

The method of gradual change is a method which can quantify the changes of the financial ratio caused by the changes of component indicators.Where ΔX is the change of the basic rati $\Delta X_{a1} = \Delta a_1 \cdot a_{2.0} \cdot a_{3.0}$ o,and ΔX_{a1} is the change caused by the indicator a.By the formula 2.4,we can calculate each change caused by the every indicators.

$$\Delta x_{a1} = \Delta a_1 \cdot a_{2,0} \cdot a_{3,0} \cdot \ldots \cdot a_{n,0} \tag{2.4}$$

$$\Delta x_{a2} = a_{1,1} \cdot \Delta a_2 \cdot a_{3,0} \cdot \ldots \cdot a_{n,0} \tag{2.4.1}$$

$$\Delta x_{a3} = a_{1,1} \cdot a_{2,1} \cdot \Delta a_3 \cdot \ldots \cdot a_{n,0} \tag{2.4.2}$$

.....

$$\Delta x_{a_i} = \Delta a_i \cdot \prod_{j \geq i} a_{j,0} \cdot \prod_{j \leq i} a_{j,1} \qquad (2.4.3)^{9}$$

2.4.2 Logarithmic decomposition method

By means of the logarithmic method,the change in all the component indicators is reflected when calculating the influence of changes in component indicators.We can also say that it is based on the continuous returns as $I_a = \frac{a_1}{a_0}$ and $I_a = \frac{x_1}{x_0}$ are continues returns of ratios “a”and “x”.The calculate is as followed:

$$\Delta x_{a_i} = \frac{\ln I_{a_i}}{\ln I_x} \cdot \Delta x \qquad (2.4.4)^{10}$$

This method is very useful in the calculation of pyramidal decomposition.It does not have so many calculating steps and it can be used in all the calculation.

2.5.Sensitive analysis

Sensitive analysis is aimed to find which indicator has a most important influence to results.It is useful for us to know how to change the final result easily.The thesis analysis the liquidity of the Caterpillar.So we will calculate the liquidity ratios.With the sensitive analysis,we can find which indicator we decompose has the big influence to the ratio.This method of analysis can help us to give advice and make decision for our company.

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[9] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.28.

[10] Source:DLUHOŠOVÁ, Dana et al.(2014). *Financial management and decision-making of a company*. Ostrava, p.29.

If we only do pyramidal analysis,we can know the part that indicators influence the results and we also change the result by make the indicators bigger or smaller.But we don't know the efficiency of each indicator to influence the result.So we need to do sensitive analysis and find the specific indicators,then we can make decision correctly.We also will do some assumptions and make some decision for future.This will be very meaningful.

3.Basic Financial Characteristic of the Selected Company

In this chapter,we will introduce the basic financial characteristic of the Caterpillar.We will tell you the history and financial condition of the Caterpillar.

3.1Basic description

Caterpillar is the world's largest manufacturer of construction, mining equipment,diesel and natural engines and industrial gas turbines.

Caterpillar's assets are more than 78 billion dollar in 2015 and it is ranked first in the machinery industry.The company also is a leading services provider through Caterpillar Financial Services, Caterpillar Re-manufacturing Services, Caterpillar Logistics Services and Progress Rail Services.

3.1.1Hisyory and Development of Caterpillar

100 years ago, Benjamin Holt built his first steam traction engine tractor and then set up the Holt Manufacturing Company.This company was the origin of the Caterpillar.

Caterpillar had it's name in 1910 as a trade mark for the Holt Manufacturing Company.After the Holt Manufacturing Company and C. L. Best Tractor Co. merged to form the Caterpillar,this brand walked on the road of being famous.

Caterpillar's first product line consists of five tractors and with time gone by,it took part in many famous buildings' construction and did good job.

In 1936, Caterpillar track-type tractors help complete the construction of the Hoover Dam.

In 1937, Caterpillar machines help complete the construction of the Golden Gate Bridge.

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In 1944, Caterpillar machines help start the construction of more than 70,000 miles of highways throughout the United States.

In 1969, Caterpillar engines supply power for the Apollo 11 mission to the moon.

In 1985, More than 450 Caterpillar machines start the construction of the Ataturk Dam in Turkey.

In 1993, Around 300 Caterpillar machines help construct the Three Gorges Dam in China.

And so on

Caterpillar also innovates many invention during it's history.With constantly innovation and high quality working,Caterpillar becomes the headquarter in machinery industry.[11]

3.1.2 Cooperation

Caterpillar not only develops well in America,it also has many national cooperation.The most we want to introduce is the cooperation with China.China is one of the most important partner for Caterpillar.The factories in China produce huge amount of products for Caterpillar and sent to everywhere in the world every year.Caterpillar's first cooperation with China was about 40 year ago.At beginning,Caterpillar sold the best machine products to China and built good relationship with China.In 1994,the first Caterpillar company in China was set up and this was a breakthrough to the cooperation between China and Caterpillar.The company's name is Caterpillar XU DONG.XU DONG not only helped Caterpillar enter into Chinese machinery market and provided many job for Chinese people.With 20 years development,XU DONG becomes better and has more influence in China.It mainly produce hydraulic excavator,crawler tractors,diesel engines,components and

[11] Source:http://www.caterpillar.com/en/company/history.html

so on.Caterpillar is strict with their workers.With the high quality requirements and high standard management,Caterpillar can produce the best products.

3.2 Financial statement of Caterpillar

In this part,we will use financial statement to know the basic financial information of Caterpillar.We will give Caterpillar's balance sheet and income statement.In next part,we can do common-size analysis to have a further understanding to Caterpillar's financial position.From these two financial statement,we also can get enough data for calculating the financial ratio.So financial statement is the most important thing we should focus on first.We can have a basic impressed to Caterpillar's performance.

3.2.1 The simplified balance sheet of Caterpillar

Table 3.2 .1 Simplified balance sheet of Caterpillar (in million dollar)

	2011	2012	2013	2014	2015
Current assets	38128	42524	38335	38867	34418
Non-current assets	43318	46832	46561	45814	44079
Total assets	81446	89356	84896	84681	78497
Current liabilities	28561	29755	27297	27877	26303
Non-current liabilities	40002	42069	36788	40058	37385
Total liabilities	68563	71824	64085	67935	63688
Shareholders' equity	12883	17532	20811	16746	14809

As we can see in table 3.2.1,we can clearly know the situation of Caterpillar's assets,liabilities and equity.We can know Caterpillar's total capital in each year and how they use these capital.Like the data in the statement,the number is very large.That can reflects Caterpillar is a very big company.Caterpillar has a lot of assets,also it has so many capital.

3.2.2 The simplified income statement of Caterpillar

Table 3.2.2 Simplified income statement of Caterpillar(in million dollar)

	2011	2012	2013	2014	2015
Revenues	60138	65875	55656	55184	47011
Cost of sales	43578	47055	40727	39767	33742
Gross profit	16560	18820	14929	15417	13269
Research and development	2297	2466	2046	2135	2165
Sales,General and administrative	5203	5919	5547	5697	5199

Other expenses	1907	1862	1708	2257	2649
Operate profit	7153	8573	5628	5328	3256
Finance income	-32	130	-35	239	106
EBIT	7185	8443	5663	5089	3150
Interest	396	467	465	484	507
EBT	6725	8236	5128	5083	2855
Taxes	1720	2528	1319	1380	742
EAT	5005	5708	3809	3703	2113

After know the situation of Caterpillar's assets,liabilities and equity.We need to focus on it's income statement.Income statement can reflect the condition of Caterpillar's performance in one year.We will know the revenues from production,cost of production and profit in each year which the statement gives.

We can know from table 3.2.2,Caterpillar's revenue is so high.That reflects Caterpillar produces lots of products in each year.Of course,the cost of production is very high,too.But the gross profit is still more than 13 thousand million dollars each year.We also can know the interest and tax paid by Caterpillar each year.Then we compare the EAT from each year,we can know the performance of Caterpillar from 2011 to 2015.

3.3 Common-size analysis

We can know company's financial performance by check financial statement,but it's not clearly and we can't know the tendency of each elements in the statements.So we need do common-size analysis to Caterpillar's financial statement.By that, we can know the changes of each elements in financial statement more clear. We have l show you the balance sheet and income statement of Caterpillar in Chapter 3.2.1 and 3.2.2.With these financial statement,we can do the horizontal and vertical common-size analysis.

3.3.1 Horizontal common-size analysis

In this part, we will do horizontal common-size analysis of Caterpillar's financial statement and calculate the absolute change and the percentage change of the items from year to year.For calculation, we will use the formula 2.23 and 2.24.

At first,we do horizontal common-size analysis for balance sheet.

Table 3.3.2 Absolute change of balance sheet from 2011 to 2015(million dollar)

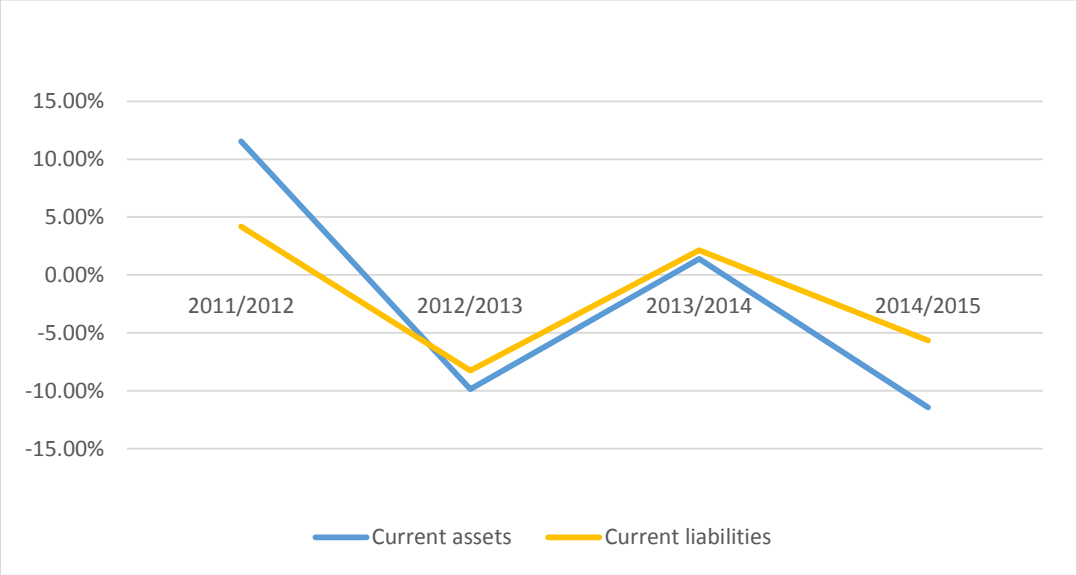
	2011/2012	2012/2013	2013/2014	2014/2015
Current assets	4396	-4189	532	-4449
Non-current assets	3514	-271	-747	-1735
Total assets	7910	-4460	-215	-6184
Current liabilities	1194	-2458	580	-1574
Non-current liabilities	2067	-5281	3270	-2673
Total liabilities	3261	-7739	3850	-4247
Shareholders' equity	4649	3279	-4065	-1937

Table 3.3.3 Percentage change of balance sheet from 2011 to 2015(million dollar)

	2011/2012	2012/2013	2013/2014	2014/2015
Current assets	11.53%	-9.85%	1.39%	-11.45%
Non-current assets	8.11%	-0.58%	-1.60%	-3.79%
Total assets	9.71%	-4.99%	-0.25%	-7.30%
Current liabilities	4.18%	-8.26%	2.12%	-5.65%
Non-current liabilities	5.17%	-12.55%	8.89%	-6.67%
Total liabilities	4.76%	-10.77%	6.01%	-6.25%
Shareholders' equity	36.09%	18.70%	-19.53%	-11.57%

Table 3.3.2 and 3.3.3 show the results of horizontal analysis.As further part said,if we want to analysis the liquidity of company,we need to focus on the company's current assets and current liabilities.Then we do the analysis by chart.

Chart3.3 Horizontal common-size analysis of Caterpillar



As we can see from chart 3.3,for the percentage change of current assets,it is increased 4396 which is about 12% in 2012 and then it is decreased 4189 which is about 10% in 2013.In 2014 it only change 532 current assets,but in 2015,it is decreased 4449 which is about 11%.

For the percentage change of current liabilities, it is increased 1194 which is about 4.18% in 2012.In 2013 it is decreased 2458 which is about 8.26%.There is not so many change on current liabilities in 2013 which it is increased 2.12%.At last,in 2015 ,it is decreased 1574 which is about 5.63%.

During the time from 2011 to 2015,Caterpillar acquires 3 companies ,this makes it's current assets and currents liabilities up and down.The situation always is that while current assets have a positive change,the current liabilities also have a positive change and it is the same for negative change.This makes a dynamic equilibrium for Caterpillar's balance sheet.

At second, we do horizontal common-size analysis to income statement.

Table 3.3.4 Absolute changes of each items in income statement

	2011/2012	2012/2013	2013/2014	2014/2015
Revenues	5737	-10219	-472	-8173
Cost of sales	3477	-6328	-960	-6025
Gross profit	2260	-3891	488	-2148
Research and development	169	-420	89	30
Sales, General and administrative	716	-372	150	-498
Other expenses	-45	-154	549	392
Operate profit	1420	-2945	-300	-2072
Finance income	162	-165	274	-133
EBIT	1258	-2780	-574	-1939
Interest	71	-2	19	23
EBT	1511	-3108	-45	-2228
Taxes	808	-1209	61	-638
EAT	703	-1899	-106	-1590

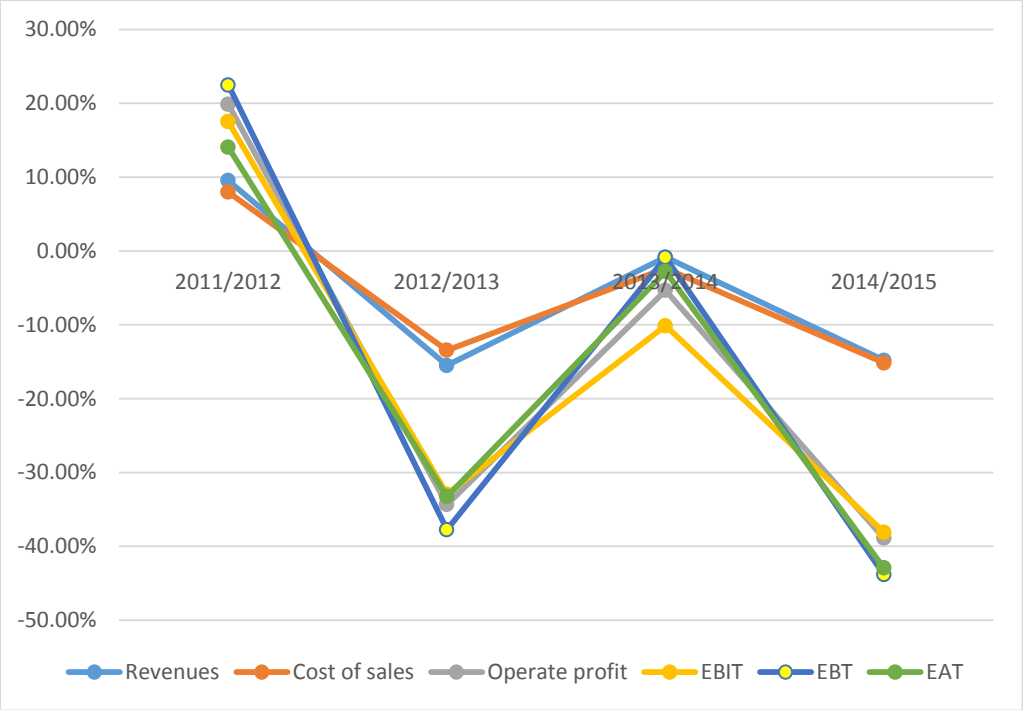
Table 3.3.5 Percentage changes of each items in income statement

	2011/2012	2012/2013	2013/2014	2014/2015
Revenues	9.54%	-15.51%	-0.85%	-14.81%

Cost of sales	7.98%	-13.45%	-2.36%	-15.15%
Gross profit	13.65%	-20.67%	3.27%	-13.93%
Research and development	7.36%	-17.03%	4.35%	1.41%
Sales, General and administrative	13.76%	-6.28%	2.70%	-8.74%
Other expenses	-2.36%	-8.27%	32.14%	17.37%
Operate profit	19.85%	-34.35%	-5.33%	-38.89%
Finance income	-506.25%	-126.92%	-782.86%	-55.65%
EBIT	17.51%	-32.93%	-10.14%	-38.10%
Interest	17.93%	-0.43%	4.09%	4.75%
EBT	22.47%	-37.74%	-0.88%	-43.83%
Taxes	46.98%	-47.82%	4.62%	-46.23%
EAT	14.05%	-33.27%	-2.78%	-42.94%

Table 3.3.4 and table 3.3.5 show us the absolute change and percentage of each items in Caterpillar's income statement.From the income statement,we can know how many income the company has in 1 year.We can know its financial situation on the income.We make the result to the chart in order to analysis intuitively.We chose 6 important items,they are : Revenues,Cost of sales,Operate profit,EBIT,EBT and EAT.

Chart 3.3.1 Percentage change of items in income statement



From chart 3.3.1,we can clearly see the changes of 6 items in 5 years.From 2011 to 2012, the percentage changes of 6 items are positive.That reflects: in 2012 ,Caterpillar has more income than 2011.Caterpillar has better income situation in this year.

From 2012 to 2013,the percentage changes of 6 items are negative.Because of the decrease of revenue,the cost of sale is decreased too.The revenue is decreased 10249 which is -15.51%.The cost of sale is decreased 6328 which is -13.45%.The operate profit is decreased 2945 which is -34.35%.The EBIT is decreased 2780 which is -32.93.EBT is decreased 3108 which is -37.74% and EAT is decreased 1899 which is -33.27%.The 6 items are all decreased a lot and the EBT is the lowest.Main reason is that with the big deceased of operate profit,the percentage change of interest is little.

From 2013 to 2014, the percentage change of 6 items is very small.The items which change the largest is EBIT.That's because the interest is increased 4.09% in this year. Tax is decreased 4.69%,so the EAT is only changed -2.78%.

From 2014 to 2015,the percentage change of 6 items is negative again.That means the Caterpillar has less income in 2015.The revenue has 14.81% negative change and cost of sale has 15.15% negative change.The operate profit and EBIT have around 38% negative change.The EBT and EAT have around 43% negative change.On the whole,Caterpillar's income is increased from 2011 to 2012 and has a continuous decreased from 2012 to 2015.

3.3.2 Vertical common-size analysis of Caterpillar

In chapter 3.3.1 we do the horizontal common-size analysis and we get some useful conclusions. In this section, we start to do vertical common-size analysis of Caterpillar's financial statement and find the structure of them.

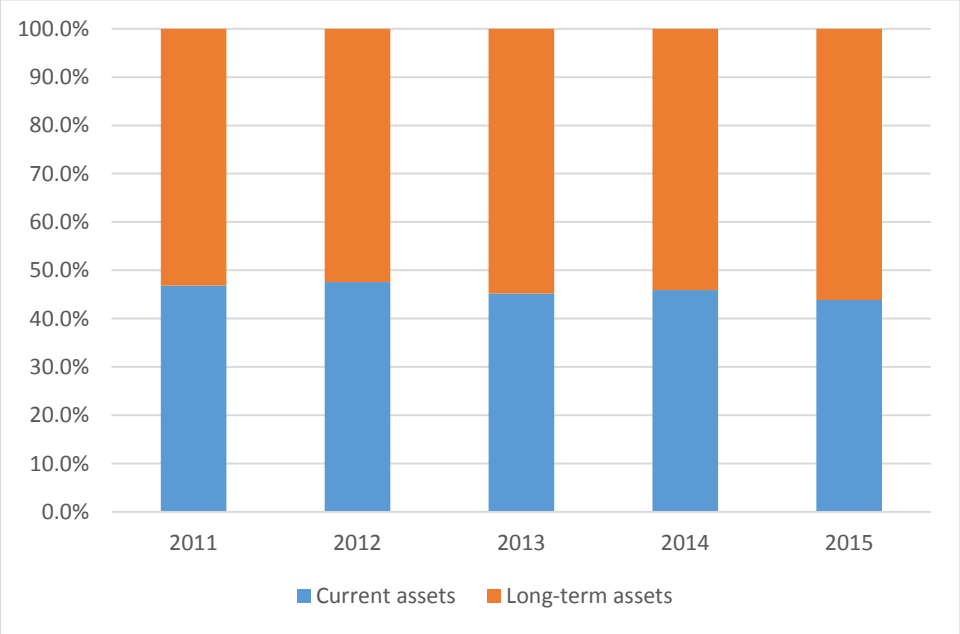
First we do vertical common-size analysis for Caterpillar's balance sheet.

Table 3.3.6 Vertical common-size analysis of assets in balance sheet

	2011	2012	2013	2014	2015
Current assets	46.8%	47.6%	45.2%	45.9%	43.8%
Total cash	3.8%	6.1%	7.2%	8.7%	8.2%

Account receivables	22.0%	21.2%	20.2%	19.8%	20.0%
Inventories	17.9%	17.4%	14.9%	14.4%	12.4%
Other current assets	3.2%	2.8%	2.9%	3.0%	3.3%
Long-term assets	53.2%	52.4%	54.8%	54.1%	56.2%
Total assets	100.0%	100.0%	100.0%	100.0%	100.0%

Chart 3.3.2 proportion of each items in balance sheet.



In table 3.3.6,we give the proportion of current assets and non-current assets in total assets and the proportion of indicators belong to current assets in total assets.In chart 3.3.2,we compare the proportion of current and non-current assets in total assets in the chart aimed to find the structure of total assets and relationships between them.

In 2011,the proportion of current assets is 46.8% and the non-current assets is 53.2%.For the indicators in current assets,the proportion of account receivables is the biggest,which is 22.0% and inventories is ranked second, which is 17.9%.We can find that,the proportion of current assets and non-current assets is closed to 50% and the main indicators in current assets are account receivables and inventories..

In 2012, the proportion of current assets is 47.6% increased 0.8% and the non-current assets is 52.4% decreased 0.8%.The change of them is very little.The percentage changes of the indicators in current assets are also very small.Account receivables is decreased 0.8% to 21.2% and inventories is decreased 0.5% to 17.4% but cash is increased 2.3% to 6.1%.

In 2013, the proportion of current assets is 45.2% decreased 2.4% and the non-current assets is 54.8% increased 2.4%.To compare with prevail 2 years,changes in this year is big.In the structure of total assets,non-current assets has a 9.6% bigger than current assets.For the indicators in current assets,the account receivables changes very little,which is 20.2%.The inventories is decreased from 17.4% to 14.9%.This is the reason why the proportion of current assets is decreased a lot.

In 2014, the proportion of current assets is 45.9%,which is increased about 0.7% and the non-current assets is 54.1% decreased 0.7%.This year,there isn't many changes in the structure of total assets.For the indicators in current assets,it also changes very little.

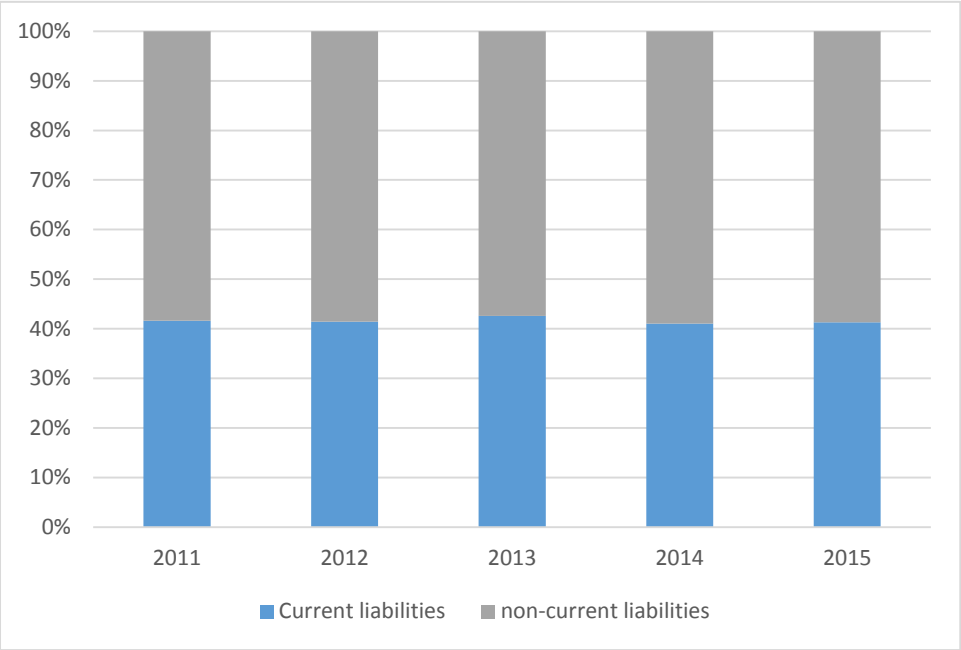
In 2015, the proportion of current assets is 43.8% decreased 1.4% and the non-current assets is 56.2% decreased 1.4%.Current assets is decreased again,we can see from the indicators.Although account receivables doesn't change a lot, the inventories is decreased from 14.4% to 12.4% and cash is decreased from 8.7% to 8.2%.That's why the proportion of current assets is decreased again.

From 2011 to 2015 the percentage of current assets and long-term assets are changed very small and total assets has a stable structure.The more percentage current assets has, the more change company has to convert it to the cash.High percentage current assets also means company has good liquidity.Caterpillar's current asset is around 45%,so it's easy to change them to cash.

Table 3.3.7 Proportion of each items of total liability in balance sheet

	2011	2012	2013	2014	2015
Current liabilities	41.7%	41.4%	42.6%	41.0%	41.3%
Short-term debt	14.1%	17.3%	17.2%	16.9%	20.2%
Accounts payable	11.9%	9.4%	10.2%	9.6%	7.9%
Accrued liabilities	8.5%	7.8%	8.0%	8.8%	8.0%
Deferred revenues	3.9%	4.1%	3.7%	2.5%	1.8%
Other current liabilities	3.3%	2.9%	3.5%	3.2%	3.4%
non-current liabilities	58.3%	58.6%	57.4%	59.0%	58.7%
Total liabilities	100.0%	100.0%	100.0%	100.0%	100.0%

Chart3.3.3 Proportion of current liabilities and non-current liabilities in total liabilities



We can see from the table 3.3.7 and the chart 3.3.3,there are 2 part in total liabilities,they are current liabilities and non-current liabilities.From 2011 to 2015,the proportion of 2 elements is very stable.During the 5 years, the proportion of current liabilities is around 41% and the proportion of non-current liabilities is around 58%.

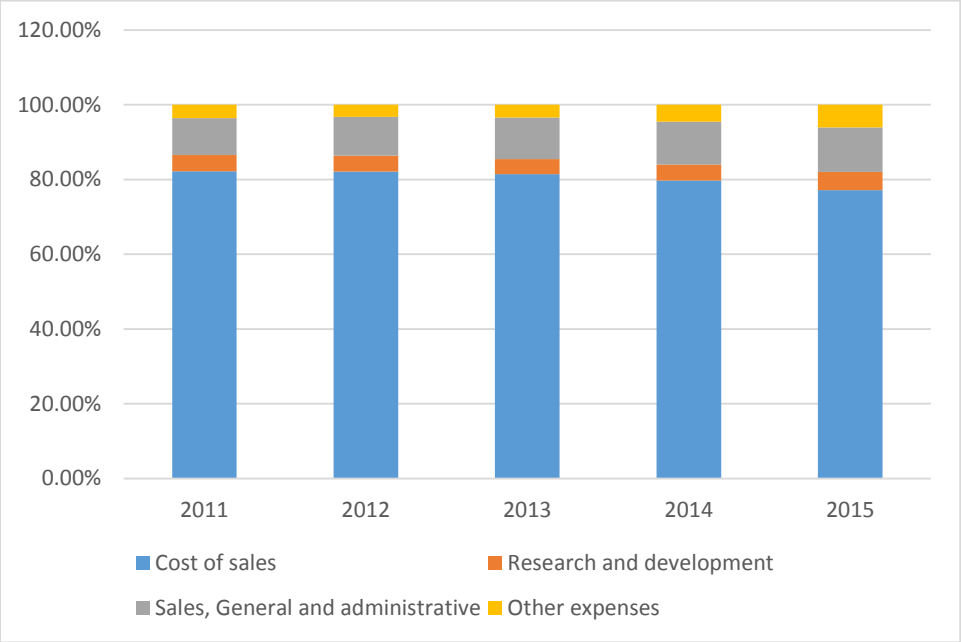
Then we start to do vertical common-size analysis of income statement.

From the income statement,we can know the revenues,expenses and profit.If we can decrease the cost,we can increase the profit.In this part,we focus on the expenses and aim to find the structure of the expense.

Table 3.3.8 Vertical common-size analysis of expenses in income statement

	2011	2012	2013	2014	2015
Cost of sales	82.25%	82.12%	81.41%	79.76%	77.12%
Research and development	4.34%	4.30%	4.09%	4.28%	4.95%
Sales, General and administrative	9.82%	10.33%	11.09%	11.43%	11.88%
Other expenses	3.60%	3.25%	3.41%	4.53%	6.05%
Total expense	100.00%	100.00%	100.00%	100.00%	100.00%

Chart 3.3.4 Proportion of each items in expenses.



From the table 3.3.8 and chart 3.3.4,we can see the structure of Caterpillar's expense of income statement.There are 5 parts in the expenses:Cost of sales,expenses on research and development,expense on sales,general and administrative and other expenses.

For cost of sales,it is decreasing year by year,but the percentage of decrease is very little which it is 82.25% in 2011 and it is 77.12% in 2015.

For expenses on research and development,it is around 4.3% beside 2013 and 2015.In 2013,the percentage of expenses on research and development is 4.09% which it is 4.95% in 2015.

For expenses on sales,general and administrative, it is increasing from 2011 to 2015,which it is 9.82% in 2011 and it is 11.88% in 2015.

4. Analysis of Liquidity of the Selected Company

4.1Financial ratio analysis

In this part we will analysis the data from the statement by financial ratio.There are 4 kinds of financial ratios:active ratio,solvency ratio,liquidity ratio and profitability ratio.We will only analysis the liquidity in my thesis.We firstly compare 3 companies' liquidity ratio and after that we will decompose one ratio of liquidity ratio and analysis what indicator cause the differences.

4.1.1 Liquidity ratio Analysis

Liquidity ratio are a kind of ratio to judge the company's ability to pay off it's short-terms liability.The higher the ratio is also means the company has a good ability to translate the current asset into cash.For each company, the important is that liquidity ratio should be a certain range.If it is too low,it means company can't pay off it's short-terms debt.If it is too high,it means company doesn't use the cash efficiently.

Table 4.1 Liquidity ratio of Caterpillar

YEAR	2011	2012	2013	2014	2015
Current ratio	1.33	1.43	1.40	1.39	1.31
Quick ratio	1.23	1.24	1.18	1.13	1.06
Cash ratio	8.02%	12.91%	15.86%	18.89%	18.77%

From table 4.1 we can know the liquidity ratio includes:Current ratio,Quick ratio,Cash ratio.We can use the equations in chapter 2 to calculate them.These ratio can reflect the ability for company to pay off their obligation.

Then, I will show you another two companies' liquidity ratio in same industry.

Table 4.1.1 Liquidity ratio of Komatsu

YEAR	2011	2012	2013	2014	2015
Current ratio	1.56	1.89	1.89	1.80	1.62
Quick ratio	1.45	1.76	1.77	1.69	1.53
Cash ratio	6.77%	7.05%	6.10%	6.29%	5.93%

We can know the liquidity of Komatsu in table 4.1.1.The indicator we calculate is used to comparing with the company we choose and know the advantages and disadvantages of each company.

Table 4.12 Liquidity of Terex

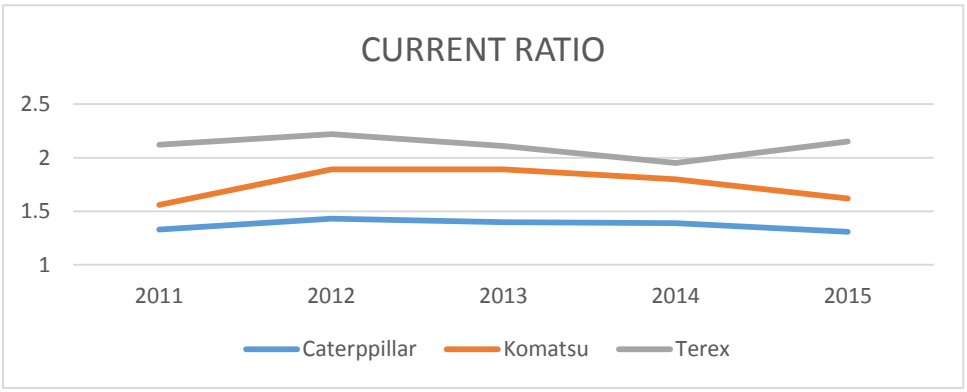
YEAR	2011	2012	2013	2014	2015
Current ratio	2.12	2.22	2.11	1.95	2.15
Quick ratio	1.71	1.83	1.87	1.75	1.84
Cash ratio	19.36%	17.86%	11.21%	14.24%	14.82%

As we can see from the table 4.12. We can know the liquidity ratio of Terex.By comparing with another 2 companies,we can know each company's ability to translate the current asset to cash and the situation of asset utilization.

Table 4.1.3 Current ratio

YEAR	2011	2012	2013	2014	2015
Caterpillar	1.33	1.43	1.4	1.39	1.31
Komatsu	1.56	1.89	1.89	1.8	1.62
Terex	2.12	2.22	2.11	1.95	2.15

Chart 4.1 Current ratio



Starting to calculate the current ratio,we need to know total current asset and total current liability,then use the formula in chapter 2 and we will get the result.

As we see in table 4.1.3 and chart 4.1,we can clearly know many useful information.The Terex has the highest current ratio,Komatsu has the second and Caterpillar has the worst result.

For Caterpillar,we can see the current ratio is increased 7.5% in 2012.The reason is that Caterpillar increases it's current asset from 38124 mil dollar to 42524 mil dollars.In 2013 Caterpilar decreased it's current asset to 38335 mil dollar and the current ratio decreased to 1.4. In 2014,there were not big changes in Caterpillar's current asset and current liability ,so the current ratio changes very little is 1.39.But in 2015,the current asset is decreased to 34418 mil dollar and the current liability is still at a high level.So the Current ratio is changed to 1.31 which is lower than it was in 2011.

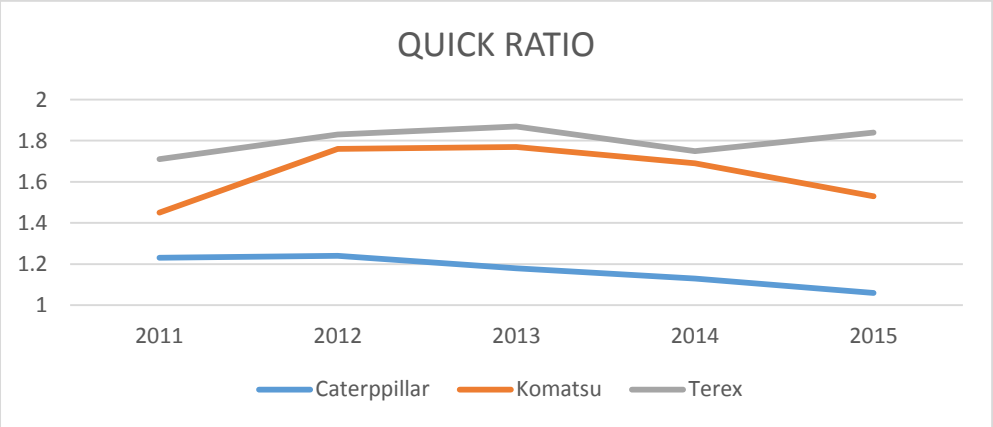
For Komatsu ,we can see the current ratio is increased from 1.56 to 1.89 in 2012 and it is still 1.89 in 2013.The reason is that in 2012,it increased the current asset from 1244372 mil JPY to 1521435 mil JPY which is about 22% increased in current asset.After 2013 ,the current asset start to decrease and that's the why the current ratio is decreased to 1.62.

For Terex, it has the best performance amount this 3 companies.From 2011 to 2015,it all has the high level of current ratio and it is very stable from 2.12 to 2.15.This is because when Terex decreases it's current asset, it also decreased it's current liability.

Table 4.1.4 Quick ratio

YEAR	2011	2012	2013	2014	2015
Caterpillar	1.23	1.24	1.18	1.13	1.06
Komatsu	1.45	1.76	1.77	1.69	1.53
Terex	1.71	1.83	1.87	1.75	1.84

Chart 4.1.1 Quick ratio



Quick ratio: For calculation ,we will use the data of current asset,inventory and current liability.Usually we say if the quick ratio is below 1 ,the ability of paying off the obligation is very bad.

From Table 4.1.4 and Chart 4.1.1 we can know that 3 companies' quick ratio are all bigger than 1,so we can say they have the fundamental ability to pay their debt.But as the biggest companies in same industry,Caterpillar still has the worst result,which Terex is the best again.

For Caterpillar,in 2012 the quick ratio is changed very little from 1.23 to 1.24.That's because the inventory is increased a little but the current asset is increased from 38128 mil dollar to 42524 mil dollar.But the quick ratio start to decrease from 2013 to 2014.The most important reason is the significant decrease of current asset.In 2015,the current asset is only 34418 mil dollar,which has about 20%difference from what it is in 2012.

For Komatsu,it has the good performance in 2012 and 2013,which quick ratio is 1.76 and 1.77.That's because in this 2 year,it increases the current asset and decreases the inventory.But after that ,it decrease the current asset 1400372 mil JPY which it is 1521435 mil JPY in2012.So the quick ratio is decreased in 2015.

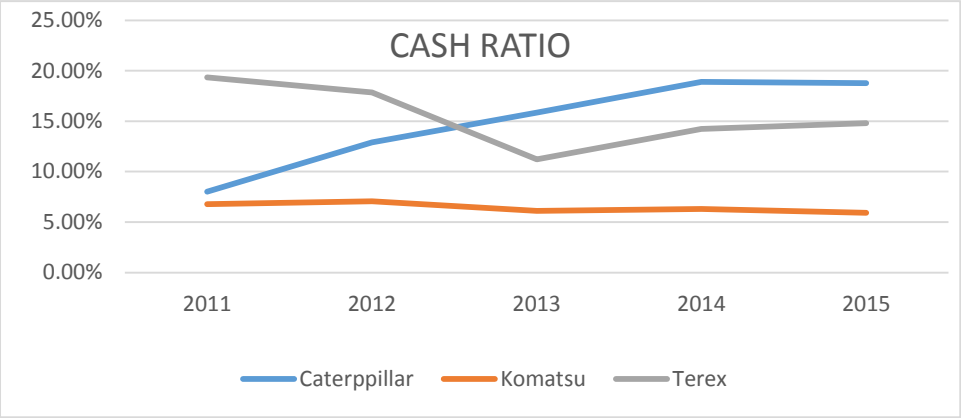
For Terex,it has good liquidity all the year from 2011 to 2015.The quick ratio from 2012 to 2014 are all better than it is in 2011.We can see from the Terex balance

sheet,when Terex start to decrease the current asset ,it also decrease the inventory and current liability.Terex always keep itself has a good ability to pay off it's obligation.But with the higher liquidity,we will guess whether it doesn't use their cash efficiently.

4.1.5Cash ratio

YEAR	2011	2012	2013	2014	2015
Caterpillar	8.02%	12.91%	15.86%	18.89%	18.77%
Komatsu	6.77%	7.05%	6.10%	6.29%	5.93%
Terex	19.36%	17.86%	11.21%	14.24%	14.82%

Chart 4.1.2 Cash ratio



Cash ratio:For calculation ,we need to know the total cash account and current asset and then use the formula in chart 2 and we will get the results we need.

From table 4.1.5 and chart 4.1.2 we can know that the cash ratio of Caterpillar has a continuous increase which Komatsu's has a continuous decrease and Terex's is decreased in first 3 years and is increased in last 2 years.

For Caterpillar,cash ratio is the only liquidity ratio which it has good performance.In 2012,the cash ratio is increased to 12.91%.The main reason is that it Caterpillar increases total cash from 3057 mil dollar to 5490 mil dollar which increases about 44% of total cash.In 2013,the cash ratio is increased to 15.86%.That's because it increased total cash again.In 2014 the cash ratio is increased to 18.89,which is caused by the decrease of current asset and the nearly no change of total cash.In

2015,although the current asset is increased to 34418 mil dollar,the cash is increased to 6460.So the cash ratio has a little down,the result is 18.77%

For Komatsu,it has the best performance in cash ratio and the result is stably low from 2011 to 2015.The main reason is that the structure of it's current asset,the total cash is very less.Komatsu uses most of their cash to invest in short-term market.So it has high current asset and low cash.That's why the cash ratio of Komatsu is so low.

For Terex,the cash ratio change a a lot from 2011 to 2015.In first to year,Terex has a high level of cash ratio but it is decreased a lot in 2013.In 2013,the cash iratio is only 11.21%,it decreases 6.65%.We can see from the financial statement of Terex,the total cash is 408 mil dollar,which it is 678 mil dollar in 2012 and that causes the decrease of Terex's cash ratio.In 2014,the cash ratio is increased to 14.23.The main reason is that Terex decrease the current asset to 3356 mil dollar this year, which it is 3639 mil dollar in 2013.In 2015 ,Terex also decreases it's current asset and has nearly no change in cash ,so the cash ratio is increased to 14.82%.

4.2 Pyramidal decomposition

In this part, we will use the pyramidal decomposition to analysis the ratio I show you in 4.1.The method is aim to find which part in company's structure influence the final result.We will decompose the ratio to some small indicators and analysis how many influence these indicators cause to the result.

4.2.1 Pyramidal decomposition of Current ratio

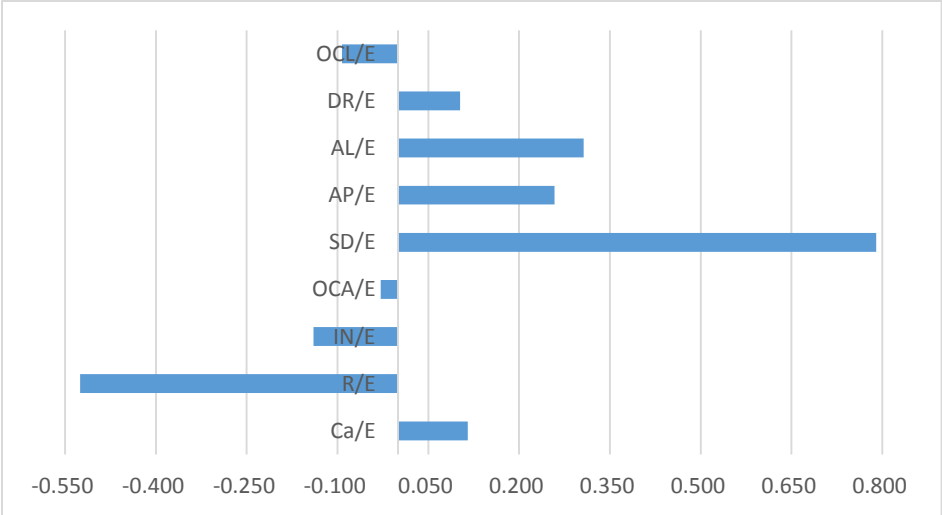
To analysis the difference of liquidity between Caterpillar and Terex.We will choose the current ratio to analysis.The reason is that current ratio includes current asset and current liability which are the most important part for people judging companies' liquidity.We do the pyramidal decomposition of current ratio in past five year from 2011 to 2015.Through this way,we can know the reason why the company has the best performance has the worst liquidity.

Table4.2 Pyramidal decomposition of current ratio of Caterpillar and Terex in 2011

Indicator	influence	influence(+，-)	order
Ca/E	0.115	+	6
R/E	-0.525	-	2

IN/E	**-0.140**	**-**	**5**
OCA/E	**-0.029**	**-**	**9**
SD/E	**0.790**	**+**	**1**
AP/E	**0.259**	**+**	**4**
AL/E	**0.307**	**+**	**3**
DR/E	**0.102**	**+**	**7**
OCL/E	**-0.092**	**-**	**8**
ALL	**0.787**		

Chart 4.2 Influence of pyramidal decomposition of current ratio of Caterpillar and Terex in 2011



We can see from the table 4.2 and the chart 4.2.Terex's current ratio has 0.787 higher than Caterpillar.There are 5 indicators have positive influence and 4 indicators have negative influence. The main indicator which causes this is SD/E.It has 0.790 positive influence to ΔCurrent ratio.The second important indicator is R/E,it has 0.525 negative influence to ΔCurrent ratio.Then is Al/E,which has 0.307 positive influence to ΔCurrent ratio.

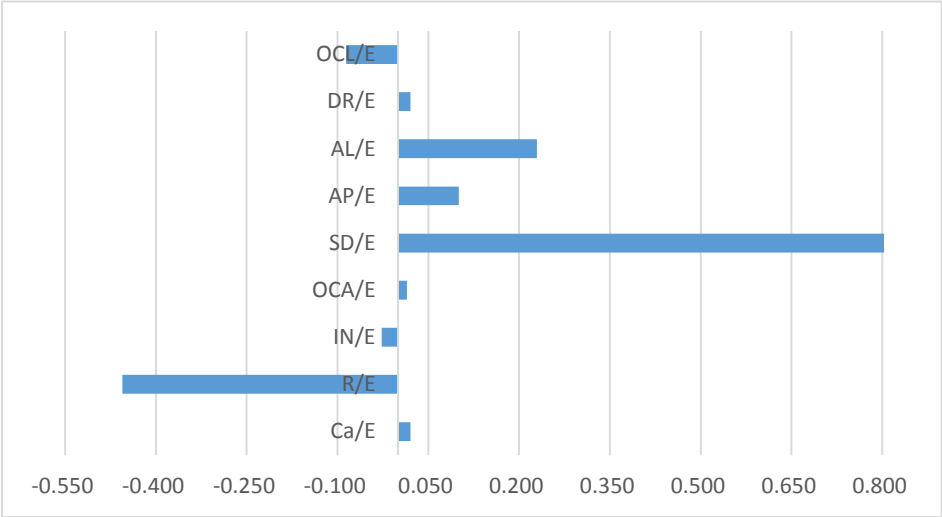
We can see from the result,except OCL/E,all the other indicators relates to the current liability has a positive influence.It reflect a problem of Caterpillar.The company has so many current liability especially the short-term debt.That's why the indicator SD/E has 0.790 influence to ΔCurrent ratio.We also should say Caterpillar has a advantage on current assets especially receivables.If the receivable is decreased,the ΔCurrent ratio will improve.But the cash in the current asset for Caterpillar is a disadvantage.We can see the CA/E has a 0.115 positive influence to ΔCurrent ratio.

For the other indicators ,their influence to the result is very little.So we need to focus on the indicator which has high influence to the result and analysis how these indicator change.For the other indicators,we only need to focus on those have opponent change.For example ,DR/E has positive influence in 2011 ,if it has negative influence in the other years ,we will find what makes it happened.

Table 4.2.1 Pyramidal decomposition of current ratio of Caterpillar and Terex in 2012

Indicator	influence	influence(+，-)	order
Ca/E	0.020	+	6
R/E	-0.455	-	2
IN/E	-0.027	-	5
OCA/E	0.015	-	9
SD/E	0.974	+	1
AP/E	0.100	+	4
AL/E	0.230	+	3
DR/E	0.020	+	7
OCL/E	-0.086	-	8
ALL	0.792		

Chart 4.2.1 Influence of pyramidal decomposition of current ratio of Caterpillar and Terex in 2012



From this two pictures,we can know that the main indicators are still SD/E,R/E and AL/E.The indicator SD/E is increased to 0.974.It has a 0.184 more positive influence to ΔCurrent ratio as it is in 2011.Re/E is decreased 0.069, which has 0.455 negative influence.AL/E is decreased 0.077,which has 0.0230 positive influence in 2012.For the indicator CA/E, it is decreased 0.094 to 0.020 negative influence.

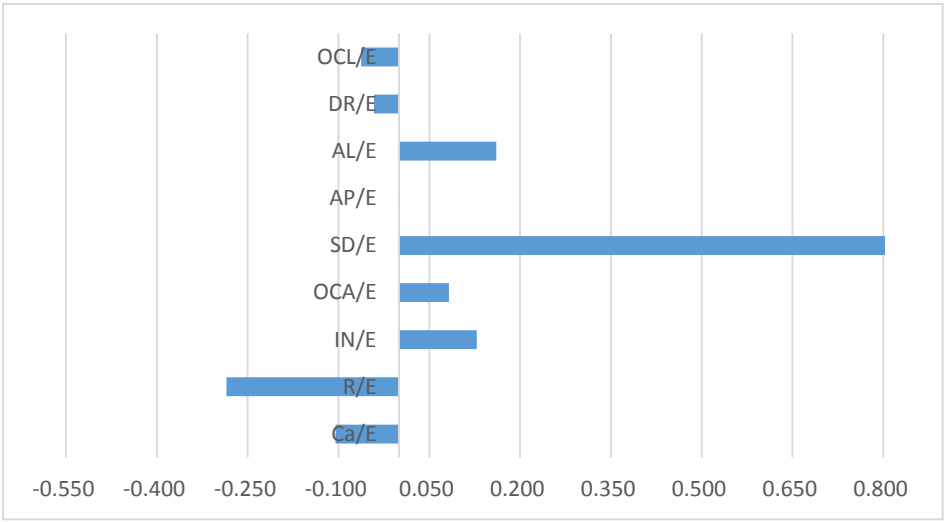
In 2012 ,Caterpillar increase short-term debt from 9648 mil dollar to 12391 mi dollar,which is about 28.50%.If Caterpillar want to improve the current ratio,it must

decrease the positive indicators and increase the negative indicators.But in 2012 ,it decreased the negative indicator CA/E and increases the positive indicator like SD/E, That's why ΔCurrent ratio is bigger in 2012.

Table 4.2.2 Pyramidal decomposition of current ratio of Caterpillar and Terex in 2013

Indicator	influence	influence(+，-)	order
Ca/E	-0.105	+	5
R/E	-0.285	-	2
IN/E	0.129	-	4
OCA/E	0.083	-	6
SD/E	0.828	+	1
AP/E	0.001	+	9
AL/E	0.160	+	3
DR/E	-0.041	+	8
OCL/E	-0.063	-	7
ALL	0.706		

Chart 4.2.2 Influence of pyramidal decomposition of current ratio of Caterpillar and Terex in 2013



From table 4.2.2 and chart 4.2.2 ,we can clearly see the order SD/E is the first and R/E is the second and SD/E is positive and R/E is negative. In 2013,the SD/E is decreased from 0.974 to 0.872,this is good for Caterpillar,but is not enough.Caterpillar still need to decrease it's short- term debt.R/E decreased from 0.455 to 0.285 and it is bad for Caterpillar.In 2013,the receivables of Caterpillar is

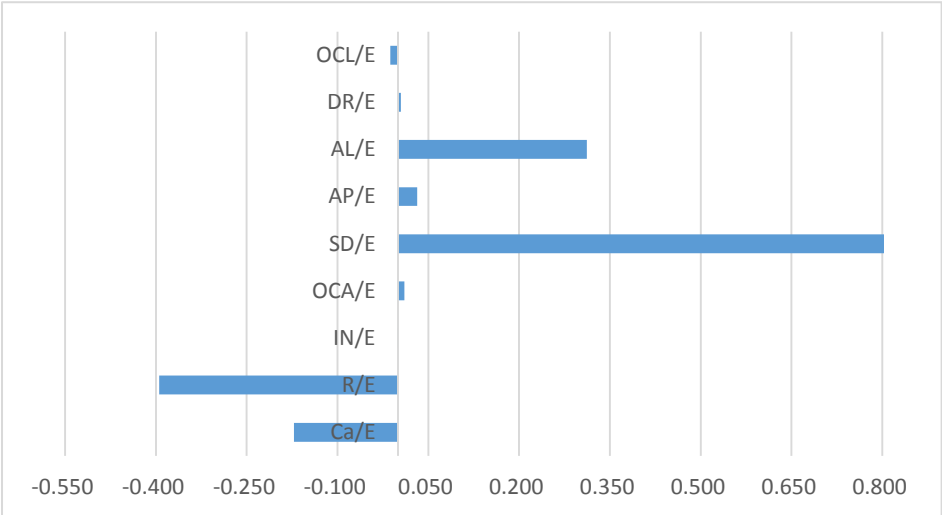
decreased from 18952 mil dollar to 17176 mil dollar and that influences the current ratio a lot.

For the other indicators,CA/E has negative influence in 2013,which has positive influence in 2011 and 2012. It reflects Caterpillar has more cash than before and it is good to it's current ratio. DR/E has negative influence,which has positive influence in 2012.That's because Caterpillar decreases the deferred revenue from 2978 mil dollar to 2360 mil dollar and that improves it's current ratio in 2013.

Table 4.2.3 Pyramidal decomposition of Caterpillar and Terex in 2014

Indicator	influence	influence(+，-)	order
Ca/E	**-0.172**	**+**	**4**
R/E	**-0.394**	**-**	**2**
IN/E	**0.000**	**-**	**9**
OCA/E	**0.011**	**-**	**7**
SD/E	**0.871**	**+**	**1**
AP/E	**0.032**	**+**	**5**
AL/E	**0.312**	**+**	**3**
DR/E	**0.004**	**+**	**8**
OCL/E	**-0.013**	**-**	**6**
ALL	**0.650**		

Chart 4.2.3 Influence of pyramidal decomposition of Caterpillar and Terex in 2014



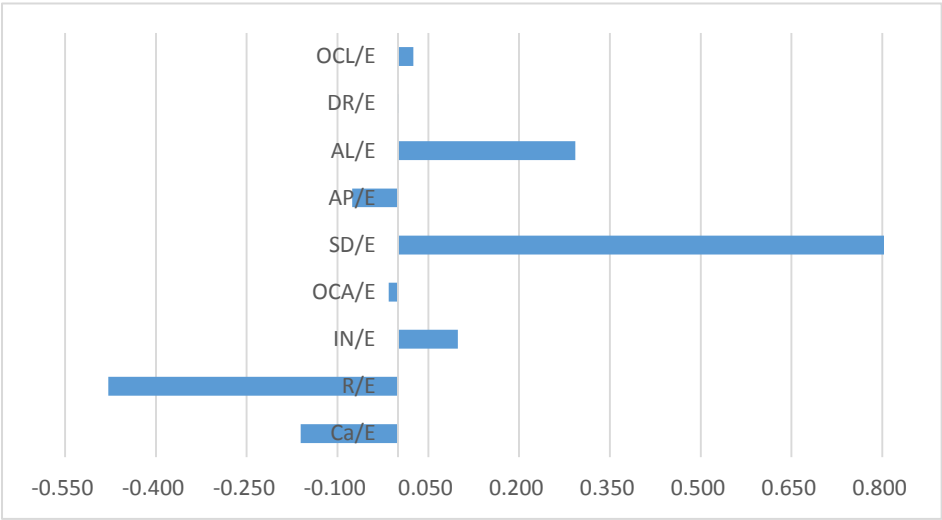
From table 4.2.3 and chart 4.2.3,we can see the sum of the indicators is 0.650 which is decreased 0.056 as it is in 2013.Then we focus on the indicators.The first order is SD/E, it is increased to 0.870 positive influence,which is 0.828 positive

influence in 2014..Although Caterpillar increases it's short-term debt,Terex also increases it's short-term debt.So the influence caused by the SD/E is not changed very big.Then is the second order,R/E is increased to 0.394,this negative indicator increases 0.109 as it is in 2013.The main reason is that Terex decreases it's receivables from 1177 mil dollar to 1068 mil dollar.Ca/E also has negative influence this year.Caterpilla increases the cash from 6081 mil dollar to 7341 mil dollar this year and Terex increases the cash from 408 mil dollar to 478 mil dollar.After calculation,Caterpillar increases 20% cash and Terex increases 17% cash .This one reason that causes the decrease of ΔCurrent ratio.

Table 4.2.4 Pyramidal decomposition of current ratio of Caterpillar and Terex in 2015

Indicator	influence	influence(+，-)	order
Ca/E	-0.161	-	4
R/E	-0.479	-	2
IN/E	0.099	+	5
OCA/E	-0.016	-	8
SD/E	1.158	+	1
AP/E	-0.076	-	6
AL/E	0.293	+	3
DR/E	0.002	+	9
OCL/E	0.025	+	7
ALL	0.846		

Chart 4.2.4 Influence of pyramidal decomposition of current ratio of Caterpillar and Terex in 2015



We can see from table 4.2.4 and chart 4.2.4, ΔCurrent ratio increases to 0.846 which it is 0.650 in 2014.So what make the this huge change?Let us see the indicators.The first order is SD/E,it has 0.116 positive influence.The influence of it is so big.We can see from the financial statement,in 2015 Caterpillar increases it's short-term debt again from 11501 mil dollars to 12846 mil dollars about 12%,but Terex decrease it's short-term debt from 152 mil dollars to 80 mil dollars about 47%.That's why the SD/E can influence a lot.

For the other indicator,R/E increase 0.084.Ca/E have a little change and it still is around 0.17 negative influence.

Caterpillar has so many short-term debt.It use it's current asset efficiently,but it also need to have more current asset to maintain a health level of current ratio.

Table 4.2.5 Summary of influence table of current ratio.

Year / Indicator	2011	2012	2013	2014	2015	Average Influence	order
Ca/E	0.115	0.021	0.105	0.172	0.161	0.115	4
R/E	0.525	0.455	0.285	0.394	0.479	0.428	2
IN/E	0.140	0.027	0.129	0.000	0.099	0.079	6
OCA/E	0.029	0.015	0.083	0.011	0.016	0.030	9
SD/E	0.790	0.974	0.828	0.871	1.158	0.924	1
AP/E	0.259	0.100	0.001	0.032	0.076	0.094	5
AL/E	0.307	0.230	0.161	0.312	0.293	0.260	3
DR/E	0.102	0.021	0.041	0.005	0.002	0.034	8
OCL/E	0.092	0.086	0.063	0.013	0.026	0.056	7
ALL	0.787	0.792	0.706	0.650	0.846	0.756	

From table 4.2.5,we can clearly see the changes in 5 years.It also gives the average influence,variance and the total influence in 5 years for each indicators.Summary table has a important role for companies.It can help us which indicator has the pivotal effect.In the five years,the indicators can be negative or positive.What we care is the absolute influence to the result.So we put all numbers in to absolute numbers and then we can clearly find which indicator has the most important influence by calculate the average influence.

At horizontal side, we can get the new ranks of Δcurrent ratio between Caterpillar and Terex.For average influence,the first order is SD/E,the second indicator is R/E and AL/E ranks the third.The average influence of these indicators are 0.924,0.428 and 0.260. By using the absolute number to calculate,we can make sure this 3 indicators have important influence to the result and the differences of this indicators between Caterpillar and Terex make the huge difference to their current ratio.

At vertical side,,the total influence is between 0.650 to 0.846.The average total influence is 0.756 .

4.3 Sensitive analysis

Sensitive analysis can help us find the sensitive indicators.The sensitive indicators are those who have a important influence to the financial ratio we analysis.

4.3.1 Sensitive analysis based on 2014 and 2015

This part ,we will do sensitive analysis to the current ratio of Caterpillar from 2014 to 2015.

After changing one element in balance sheet,we also need to change another element to make it balance.We choose 3 elements ,they are shout-term debt,receivables and inventories.

The formula of current ratio is current assets divided by current liabilities.The best way to influence the results is only change one of part.So while we change the current assets ,we can change the non-current assets or equity and it is the same for the current liabilities.By this way,we can only change one part in the formula.But we should find the connection between the elements,like if we want to increase the receivables,the profits will be increased.We need to find the achievable way for our company.

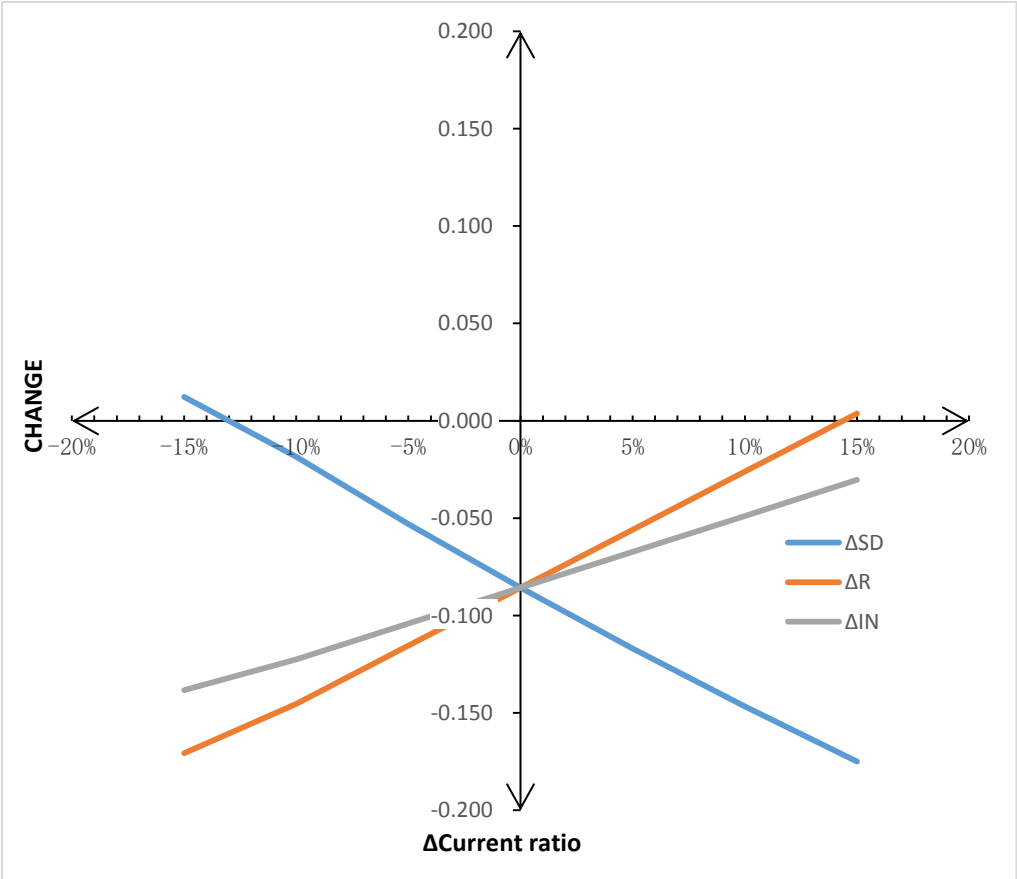
For the calculation,we increase the sensitive indicator by 5%,10% and 15% and decrease them by 5%,10% and 15%.

We get the results of each elements' influence when we change them and make it to the chart.

Table 4.3 influence of each elements

Change(%)	ΔSD	ΔCurrent ratio	ΔR	ΔCurrent ratio	ΔIN	ΔCurrent ratio
15%	1927	-0.175	2353	0.37%	1455	-3.039%
10%	1285	-0.147	1569	-2.61%	970	-4.883%
5%	642	-0.117	784	-5.59%	485	-6.727%
0	0	-0.086	0	-8.57%	0	-8.571%
-5%	-642	-0.053	-784	-11.55%	-485	-10.415%
-10%	-1285	-0.019	-1569	-14.53%	-970	-12.259%
-15%	-1831	0.012	-2235	-17.07%	-1382	-13.826%

Chart 4.3 Influence of each elements



From table 4.3 and chart 4.3 ,we can see the changes of each elements we choose.

At beginning,ΔCurrent ratio is -0.086,if we find the change can make ΔCurrent ratio bigger than -0.086,that means this change increases Caterpillar's current ratio.

The chart 4.3 chart has both positive slope line and negative slope and this is good for us to find the problems of the company and do decision.

For SD, which is a element of current liabilities,it is only one slope that has negative slope.It means,if the company increases the short -term debt ,their current ratio will decrease and it is bad for them.

For R and IN which are elements of current assets,they have positive slopes in the chart and R's slope is bigger than IN's.It means,if the company increases receivables or inventories and ,their current ratio will improve and the influence of changing receivables is more efficient than inventories.

From the chart,we can see find the sensitive indicator SD has the most important influence to the current ratio.So if Caterpillar wants to increase its current ratio.The most efficient way is to decrease the SD. We should find some way to make it.

For Caterpillar ,short-term debt is a important way to get capital.But in the structure of total liabilities,Caterpillar has so much short-term debt and it mainly cause the low current ratio it has. It should get capital from other ways.For dealing with it, Caterpillar can get enough capital by having more long-term debt or sale more equities.For the sensitive indicator IN,Caterpillar can own more products to increase the inventories.For example, Caterpillar can corporate with another company and make a contract that the company should produce enough products for Caterpillar and Caterpillar should pay it in a long period.This will increase inventories and long-term debt.Further,Caterpillar can do some marketing activities to sale the inventories which it get from first step and this will improve the receivables and profit.

There are 3 ways for Caterpillar to increase it's current ratio. The first way is to decrease the short-term debt and get enough money from long-term debt or equity.The second way is to get more money from long-term debt and produce more products and this will make inventories increase.The third way is that after getting enough capital and having more inventories ,Caterpillar sells more products,which means translate the inventories to receivables.By this way,the profit also will be increased.Of course,get capital from long-term debt will have more cost,but it is worth for Caterpillar to increase the current ratio.Because the high current ratio means the higher liquidity and this will decrease the credit risk.

4.3.2 Sensitive analysis based on 2015 and 2016

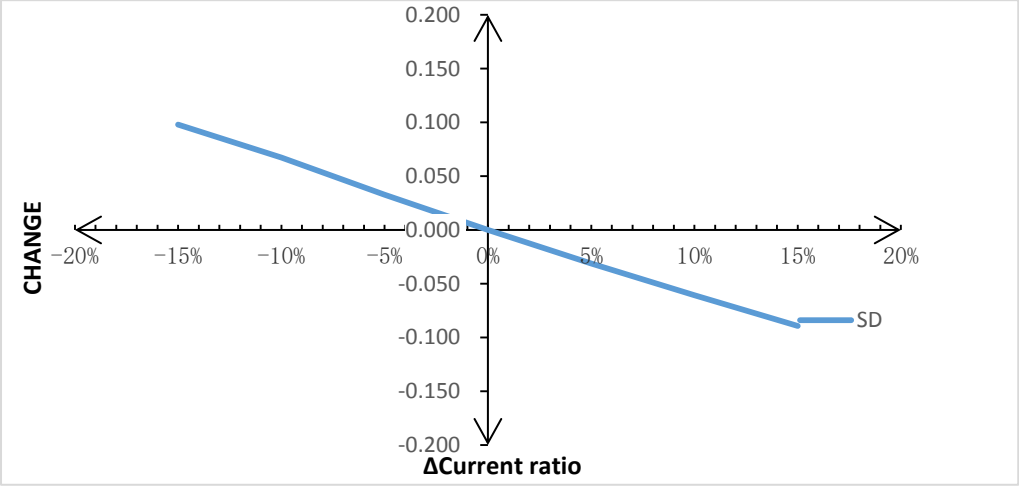
In 4.3.1,we do sensitive analysis to the data from 2014 to 2015,but it is the data in the history and we want to know if we change the sensitive indicator,what will happened in the future.In 4.31,we realize the sensitive indicator short-term debt has the most important influence to the result.So in this part,we will find how much it can influence the result in 2016 and we some conclusion for future.

We assume every indicators are same as 2015 in 2016 at beginning.Then we change the sensitive indicator short-term debt by 5%,10%,15%, -5%,-10%,-15%.The results will reflect the influence which caused by the changing of short-term debt.

Table 4.3.2 influence of short-term debt.

Change(%)	Real change	SD	ΔCurrent ratio
15%	1927	14773	-0.089
10%	1285	14131	-0.061
5%	642	13488	-0.031
0	0	12846	0.000
-5%	-642	12204	0.033
-10%	-1285	11561	0.067
-15%	-1831	11015	0.098

Chat 4.3.2 influence of short-term debt in 2016



As we can see in the chart 4.3.2,while we increase 5% SD,the influence will be about -0.03.It actually can influence current ratio a lot.The slope is negative.That means if Caterpillar wants to improve the current ratio,it need to decrease the SD.There are many ways to achieve it.Caterpillar can issue more shares or issue more long-term notes and pay out the short-term obligations.

5.Conclusion

In this chapter,we will have a review for whole thesis and get the conclusion.

In chapter 1 ,we introduce how to do the liquidity assessment of a company in machinery industry.Then in chapter 2, we introduce all the method we will use in this thesis.

In chapter 3,we know Caterpillar's history and know it's financial condition and structure by using common-size analysis and we also get many useful information of Caterpillar.In part of vertical common-size analysis,for it's current assets and current liabilities,we find the proportion of current assets is around 45% in total assets and the current liabilities' proportion in total liabilities are more than 40% during 2011to 2015.That reflects that Caterpillar has so many current liabilities.From the vertical common-size analysis,we can clearly see the changes of each elements in the financial statement.Through this analysis ,we will realize Caterpillar is a big and rich company,it also has a good financial condition.

In chapter 4,we will assess the liquidity of Caterpillar.We first do the liquidity ratio analysis.Except Caterpillar,we also choose another 2 company in the same industry and compare the 3 companies' liquidity ratio.By calculating,we realize that Caterpillar's liquidity ratios are the worst.It is strange that the company has the best performance has the bad result on liquidity.We want to find what cause these different and do pyramidal decomposition for the current ratio.We try to find what indicator influence the Δcurrent ratio between Caterpillar and Terex.After calculating the 5 years data,we put the results into summary table and calculate the average absolute change.We get a rank of these indicators:the first is short-term debt, receivables is ranked second and accrued liabilities is ranked third.These 3 indicators influence the Δcurrent ratio between 2 companies a lot.If Caterpillar want to decrease the gap,it is best to change this 3 indicators.Beside comparing with other companies,we also do the sensitive analysis for Caterpillar by using the data in 2014 and 2015.We find short-term debt,receivables and inventories are the important sensitive indicators.We

also do the expectation to 2016.We assume in 2016 the every indicator are the sane to the 2015 at begging.By this analysis,we can make some decision for Caterpillar.

Caterpillar can increase it's current ratio by two ways. The first way is to decrease the short-term debt and get enough money from long-term debt or equity.It can pay out some short-term debt and get capital by issue long-term bond or issue more equities.The second way is to get more money from long-term debt and produce more products and sells more products.By this way,the current asset will be increased and the profit also will be increased.Of course,get capital from long-term debt will have more cost,but it is worth for Caterpillar to increase the current ratio.As we informed,in Caterpillar's total liabilities,the proportion of current liabilities is so high.So it should decrease it's current liabilities. For the other reason, high current ratio means the higher liquidity, and this will decrease the credit risk.

We hope Caterpillar can be more better in the future.

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List of Abbreviations

EBIT Earning before interest and taxes

EAT Earring after taxes

EBT	Earning before taxes
CA	Current assets
CL	Current liabilities
E	Equity
Ca	Cash
R	Receivables
IN	Inventories
OCA	Other current assets
SD	Short-term debt
AP	Account payable
AL	Accrued liabilities
DR	Deferred revenues
OCL	Other current liabilities

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Student's name and surname

List of Annexes

Annexes 1: Balance sheet of Caterpillar. (million dollars)

	2011	2012	2013	2014	2015
Assets					
Current assets					
Cash and cash equivalents	3057	5490	6081	7341	6460
Receivables	17953	18952	17176	16764	15686
Inventories	14544	15547	12625	12205	9700
Deferred income taxes	1580	1547	1553	1739	1526
Prepaid expenses	994	988	900	818	1046
	38128	42524	38335	38867	34418
Non-current assets					
Gross property, plant and equipment	27326	29932	31316	31572	31977
Accumulated Depreciation	-12931	-13471	-14241	-14995	-15887
Net property, plant and equipment	14395	16461	17075	16577	16090
Equity and other investments	133	272	272	257	246
Goodwill	7080	6942	6956	6694	6615
Intangible assets	4368	4016	3596	3076	2821
Deferred income taxes	2157	2011	594	1404	1654
Other long-term assets	15185	17130	18068	17806	16653
	43318	46832	46561	45814	44079
Total assets	81446	89356	84896	84681	78497
Equity and liabilities					
Liabilities					
Current liabilities					
Short-term debt	9648	12391	11031	11501	12846
Accounts payable	8161	6753	6560	6515	5023

Accrued liabilities	5796	5578	5115	5986	5110
Deferred revenues	2691	2978	2360	1697	1146
Other current liabilities	2265	2055	2231	2178	2178
	28561	29755	27297	27877	26303
Non-current liabilities					
Long-term debt	24944	27752	26719	27784	25170
Capital leases					77
Pensions and other benefits	10956	11085	6973	8963	8843
Minority interest	46	50	67	80	76
Other long-term liabilities	4056	3182	3029	3231	3219
	40002	42069	36788	40058	37385
Total liabilities	68563	71824	64085	67935	63688
Equity					
Common stock	4273	4481	4709	5016	5238
Retained earnings	25219	29558	31854	33887	34208
Treasury stock	-10281	-10074	-11854	-15726	-17640
Accumulated other comprehensive income	-6328	-6433	-3898	-6431	-6997
	12883	17532	20811	16746	14809
Total equity and liabilities	81446	89356	84896	84681	78497

Annexes 2: Income statement of Caterpillar. (million dollars)

	2011	2012	2013	2014	2015
Revenue	60138	65875	55656	55184	47011
Cost of revenue	43578	47055	40727	39767	33742
Gross profit	16560	18820	14929	15417	13269
Operating expenses					
Research and development	2297	2466	2046	2135	2165
Sales, General and administrative	5203	5919	5547	5697	5199
Other operating expenses	1907	1862	1708	2257	2649
Total operating expenses	9407	10247	9301	10089	10013
Operating income	7153	8573	5628	5328	3256
Interest Expense	396	467	465	484	507
Other income (expense)	-32	130	-35	239	106
Income before taxes	6725	8236	5128	5083	2855
Provision for income taxes	1720	2528	1319	1380	742
Other income	-24	14	-6	8	
Net income from continuing operations	4981	5722	3803	3711	2113
Other	-53	-41	-14	-16	-11
Net income	4928	5681	3789	3695	2102
Net income available to common shareholders	4928	5681	3789	3695	2102
Earnings per share					
Basic	7.64	8.71	5.87	5.99	3.54
Diluted	7.4	8.48	5.75	5.88	3.5
Weighted average shares outstanding					

Basic earning per share	645	653	645	617	594
Diluted earning per share	666	670	659	629	601
EBITDA	10474	12313	9407	9354	6995